SCIENCE

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ARCTIC WINDS AND POLAR EXPEDITIONS.

DR. A. SUPAN discusses, in *Petermann's Mitteilungen*, Bd. xxxvii., No. 8, the movements of the air in the Arctic regions. His results are obtained from a study of Dr. Buchan's charts annexed to the "Challenger" report. Dr. Supan divides the year into three parts: the first extends from November to May; the second from June to August; and the third consists only of the months of September and October. During the first of these a belt of high pressure runs from the Asiatic to the American coast and divides the Arctic basin into two parts. On the east the air flows to the Pacific, and on the west to the Atlantic, low-pressure centre. The middle line of this ridge Dr. Supan calls the Arctic "wind parting" (*Windscheide*). But during the period in question, this wind-parting undergoes great changes in position, approaching the Behring Straits during the months of November and December, and in February beginning a rapid retrogression, which carries it past the Pole and almost to the Atlantic threshold of the Arctic regions. In summer the belt of high pressure disappears, and instead a feebly-developed anticyclone is formed somewhere in the neighborhood of the Pole, whence winds flow outwards towards the continental borders. These winds must, in such high latitudes, be diverted considerably to the east by the rotation of the earth. Lastly, during September and October, a deep barometric depression passes from the Atlantic Ocean along the northern coast of the Old World towards the New Siberia Islands. On the northern edge of this depression easterly winds must prevail. The drift of the "Jeannette," as recorded in DeLong's log-book, is a proof of the correctness of the preceding conclusions, for it must be remembered that the ocean currents are mainly directed by the wind. The vessel advanced or receded, along with the ice in which it was imprisoned, in general, at those times when, according to the foregoing theory, the wind-parting would lie to the east or west of it, respectively. Hence it is evident that vessels entering the Arctic Ocean from the Atlantic have to struggle, for the greater part of the year, against the stream, while those that enter from Behring Straits swim with it. Dr. Supan considers, in the next place, the time that will probably be required by Dr. Nansen's expedition to perform its journey across the Pole. The ice-block which transported the articles belonging to the "Jeannette" expedition covered a distance of 3,300 miles in 1,100 days, or about three miles a day. This is a rate never surpassed by the "Jeannette," except in her last forward drift, and, therefore, it may be assumed that the ice-block did not retrograde so rapidly and for so long a time as the ship. During the changes of the position of the wind-parting it may have always remained in the region of the Atlantic current. It may also be inferred from the drift of the "Jeannette" that the non-periodic displacements of the wind-parting are most marked in the neighborhood of Behring Straits, so that Dr. Nansen is likely to make rapid progress after passing the New Siberia Islands. Five years, then, may be considered as more than ample allowance for the duration of the voyage.

While Dr. Nansen's route is undoubtedly the best for vessels, the Pole may be reached with sledges by other routes. M. H. Ekroll, a Norwegian, has designed sledges, according to the *Scottish Geographical Magazine*, which may be combined to form a boat. His expedition is to consist of six members, and the sledges are to be drawn by a large number of dogs, so that the speed may be increased and the supply of provisions requisite reduced. Being able to travel over sea or ice, the expedition will, to a certain extent, be independent of wind and weather. From the eastern island of Spitzbergen, somewhere about Cape Mohn, to which place the expedition will be conveyed by ship in June, 1893, Herr Ekroll will make for Petermannsland, in order to avoid the ice drifting to the west and north-west. To the north of Petermannsland he hopes to find more compact ice, and to be able to travel direct to the Pole. Should mishap occur, or the movement of the ice be too rapid, he can retreat on Spitzbergen, where a depot will be formed, but, under favorable circumstances, he will return from his furthest point to the east or west coast of Greenland, where also depots will be formed. The success of the expedition depends in great measure on the condition of the ice and the progress that can be made against the wind, for in all probability the wind will be adverse. Dr. Supan estimates the distance from Cape Mohn to Petermannsland at about 435 miles, from Petermannsland to the North Pole at about 590, and thence to Fort Conger at 515. This distance of 1,540 miles would be traversed at the rate assumed by Herr Ekroll, 11 kilometres or about 6.8 miles per day, in 226 days. Herr Ekroll has yet to find funds for his expedition. His country cannot be expected to contribute more to such undertakings, and he will, therefore, have to look for aid elsewhere.

FUNGI INJURIOUS TO FRUITS.[1]

AT the close, a thought presses upon me that is the outgrowth of observations in the field, especially during the past two years. Your attention is called to the idea, that healthy plants of strong stock, well-fed and not overworked by undue cropping, are the best able to withstand the inroads of enemies of every sort. There may be exceptions to the rule, but so few, that it can be acted upon with profit. The half-starved plant is no better able to struggle among the vicissitudes of life than the ill-fed and half-sick man. Blights overcome the one as scurvy does the other. Therefore the best conditions for the production of profitable crops are the same as those that will most assist in warding off its fungous enemies. Let the seed, soil, and surroundings be the best and a fungicide, so to speak, has already been used when it will do the most good and render the application of others, when needed, all the more profitable. In short, strive to do the best for the fruit-tree, or shrub as such, and a long step will be taken toward overcoming the enemies that break down the weakest hosts first, because they are weak, and gain thereby strength to overcome the strong. Having done this, we are ready to take up the direct fight of the fun-

[1] From a paper, by Byron D. Halsted, before the Ohio State Horticultural Society.

gous foes with the long end of the lever. It must be a good, promising crop that will warrant the expense of fungicidal applications, and the larger the promise the greater the profit.

One other thought that follows upon this, and the end of this paper is reached. When a house or a community is afflicted with some contagious malady, pains are taken that the germs of the disease shall not remain lurking in out-of-the-way places, and assert themselves in the future. The carpets, and even wall-paper, are removed and the whole house fumigated or otherwise treated with some germ destroyer. While as thorough a cleansing as this is not possible in orchard, vineyard, or garden, there are some measures that could be taken with profit. If weeds are left to mature and scatter their seeds, weeds are expected to follow. In like manner, if all diseased leaves, stems, and fruit are allowed to pass the winter undestroyed, the chances are that the biblical injunction will not be overturned — concerning sowing and reaping. There is a legitimate and therefore profitable amount of soil-sanitation to be done, which comes under the head of cleaning up after crops. The burn-heap is to be a potent factor in future horticulture. If we continue to scatter the seeds of fungus decay, of that sowing we shall reap corruption.

It is a law of plant culture that the continuous growing of any one crop upon a given area of soil, tends to the concentration of the enemies of that crop — whether of insects or fungi. With annual crops, like most of those of the garden and grain field, the remedy is more easily applied, than in the case of fruits. There is a strong inclination to grow the crop for which the soil is naturally best fitted. Thus the onion grower desires to keep his best onion land continuously in onions, and the smut finally increases and ruins his crop and future prospects. Sweet potatoes can be grown to greatest profit only upon a special soil, in limited areas, and constant cropping has permitted the soil-rot to increase to such an extent that the crop is often a failure. The same is true of clover and other crops, but more particularly of those that are susceptible to some root disease. It therefore follows that in the serious consideration of our subject, the importance of a judicious management of crops should never be overlooked, and a system of rotation adopted that will bring the greatest health, other things remaining reasonable and satisfactory.

This continuous change of crops, united with full rations of available plant food, and proper sanitation, will do much to lighten the labors of the fungicidal applications, and render all such when found necessary of the greatest benefit.

Let the spraying of crops with compounds of copper, etc., come after the fair thing has been done for that crop under the head of farm or garden management. Here, as elsewhere, the ounce of prevention is worth a pound of cure, simply because it is prevention, and if we look at fungicides carefully, it will be found that they are preventions, after all.

Do not let me be misunderstood in this matter, for I am a full believer in the virtues of fungicides. There are many places where they pay and pay well, but they cannot do everything. They may ward off destructive diseases, as the copper salts for the black-rot of the grape, but they alone will by no means bring a profitable crop. Everything else needs to be done for the vines that will bring a full fruitage, and then it will pay to save the crop from premature decay. And finally, to carry my point one step further, when the plants have been surrounded by the best sanitary conditions, it is possible that the application of fungicides may be sometimes omitted. However, it will be a long time before all these points are settled, and in the mean time nothing is lost by turning them over in our minds.

ASTRONOMICAL NOTES.

A PLANET of the twelfth magnitude was discovered by Borrelly at Marseilles, France, Nov. 27. The position of the planet was in R.A. 4 h. 6 m. 6.7 s, $\delta + 33° 32' 58''$. The motion was -1 m. in R.A. and $-7'$ in declination.

The following ephemeris will assist those who desire to make a search for Winnecke's periodic comet, mention of which was made in a recent number of *Science*. The epoch of the ephemeris is for Berlin midnight.

1892	R.A.			Dec.	
	h.	m.	s.	°	′
Jan. 1	12	17	12	+13	2
2		18	15	13	4
3		19	17	13	7
4		20	18	13	9
5		21	20	13	12
6		22	20	13	15
7		23	20	13	18
8		24	20	13	21
9		25	19	13	25
10		26	17	13	29
11	12	27	15	+13	33

The following is a continuation of the ephemeris for Wolf's comet. The epoch is for Berlin midnight.

1891	R A.			Dec.	
	h.	m.	s.	°	′
Dec. 27	4	14	22	−14	37
29		14	19	14	26
31		14	33	14	16
1892 Jan. 2		14	33	14	5
4		14	51	13	53
6		15	15	13	39
8		15	45	13	25
10	4	16	22	−13	16

An interesting fact connected with the movement of this comet through the heavens, as seen from the earth, is that on the 6th of next February it will occupy almost the same position in the sky that it did on Nov. 12 last. This is also true of Nov 14 and Feb. 8; Nov 16 and Feb. 10. G. A. H.

NOTES AND NEWS.

THE *Pintor* or *Aguaje* is a singular phenomenon observed in the Bay of Callao during the summer months, from December to April. It consists of emanations of sulphuretted hydrogen gas, accompanied by changes in the color of the sea-water. The name "Painter" is given to it because it gives white paint a blackish tinge. Its occurrence is not confined to Callao, but is observed at various points along the coast from Payta (5° 5′ 30″ south latitude) to Pisco (13° 42′ 42″ south latitude), and at Pacasmayo (7° 24′ 30″ south latitude). The gas proceeds from the black mud which covers the bottom of the bay, and the reddish discoloration of the water is due to the presence of infusoria brought in from the open sea. It is not, however, definitely decided why the phenomenon occurs only in the summer and at certain points of the coast. According to Raimondi (*Bull of Amer. Geog. Soc.*, Vol. XXIII., No. 3), the waters of the Rimac are prevented from escaping from the Bay of Callao by the Humboldt current, which flows past the entrance, and, with the solid matter held in suspension, are exposed to the full force of a tropical sun. Where there is no river, or no current running along the coast, the "Painter" is not observed.

— A great deal of misapprehension is often found to exist in the popular mind in regard to matters of eating and drinking; the cause of this to some extent is to be traced to old time sayings, which have come down to us in the form of a concentrated infusion of somebody's opinion upon a subject of which he or she was wofully ignorant. One of these misapprehensions to which we may refer is as to the injuriousness of taking fluid with meals. One frequently hears it laid down as a maxim that "it is bad to drink with your meals, it dilutes the gastric juice." By way of explanation we may remark, says the *Medical Press*, that "it implies that the fluid taken is harmful." Whence this sagacious postulate originally came we cannot tell; it has quite the ring about it of an inconsequent deduction formed by a person whose presumption of knowledge was only exceeded by a lamentable ignorance of the subject. Medical men often find much difficulty in dealing with these museum specimens of antiquated science, for even educated persons are disposed to cling to the absurdities of their youth. Upon this matter Mr. Hutchison remarks in the last number of his *Archives:* "I observe with pleasure that the verdict of general experience and common sense has been confirmed by scientific experiment in the matter of taking fluid with meals. Dr. Tev. O. Stratievsky of St. Petersburg, after elaborate trials, has found that fluids materially assist the assimilation of proteids, and announces the following conclusion, which it is to be hoped no future experiments will controvert — on the whole, the widely-spread custom of taking fluids during or just before one's meals, proves to be rational and fully justified on strict scientific grounds. To take fluids with the meals is almost as important an adjunct to digestion as is the mastication of solid food preparatory to swallowing it. It is obvious, however, that there is a limit to the amount of fluid one can swallow with impunity — not to speak of comfort — just as much with meals as at other times." It would be dangerous to create a general impression that fluid is good with food irrespective of quantity. It is, moreover, a well-ascertained clinical fact that an excess of cumprandial fluid does retard digestion in certain people, and gives rise to discomfort in most. A little attention to one's sensations in such matters will far better fix the desirable limit than all the "data" in the world.

— A meeting of the honorary council of advice in connection with the Crystal Palace Electrical Exhibition, which is to be opened in London on Jan. 1 next, was held recently at the Mansion House. Mr. Gardner, the secretary of the Crystal Palace Company, read the report of the directors, in which they referred to the Electrical Exhibition at the Palace in 1881, and to the enormous strides which had since been made in the industry. The exhibition in 1881 was recognized as the pioneer of electrical engineering in England, and it was confidently believed that the exhibition of 1892 would be remembered in history "as showing that the infant Electra has grown to years of maturity, and is capable of further aiding science, commerce, and the world at large." The space available had been over-applied for, and every section of the industry would be well represented. Invitations would be issued to public bodies throughout the United Kingdom to visit the exhibition, where the various systems of electric lighting would be on view, and in this direction alone very great saving of expense to the authorities would be effected, and other advantages must, the directors believed, also accrue. On the motion of Mr. W. H. Preece, the following gentlemen were appointed to act as a committee of experts in connection with the exhibits: Professors W. Grylls Adams, W. E. Ayrton, W. Crookes, D. E. Hughes, A. B. W. Kennedy, J. Perry, and Silvanus Thompson, Major P. Cardew, Sir J. N. Douglass, Mr. W. B. Esson, Mr. Gisbert Kapp, and Mr. Preece.

— The temperature of the rivers of central Europe has been recently investigated by Herr Forster of the Society of Geographers at Vienna University, says *Nature;* the monthly and annual means being obtained from thirty-one stations. He distinguishes (with reference to river and air temperature) the following types: (*a*) Glacier rivers. These are always warmer than the air in winter, and much cooler in summer; on the average of the year they are about 1° colder. (*b*) Glacier rivers modified by lakes, and rivers from lakes in general. These are, except in the spring, warmer than the air, therefore warmer on the general average. (*c*) Mountain rivers. Like glacier rivers, these are warmer in winter and cooler in summer than the air, but the difference, especially in summer, is not nearly so great; so that, on the average of the year, it is approximately 0°. (*d*) Flat country rivers. Their temperature is, throughout the year, higher than that of the air; and the annual average difference is over 1°. Sometimes a different relation between river and air temperature is found in the upper part of a river and in the lower, and transition-types occur between those above indicated.

— A new system of wood-paving that is now being tried in Paris makes use of pieces of oak about four inches long, split up similarly to ordinary kindling-wood. The sticks are laid loosely on end in fine sand on a bed of gravel from four to four and one-half inches thick. A layer of fine sand is spread over them, and they are alternately watered and beaten several times. In about forty-eight hours the water has completely penetrated the wood causing it to swell into a compact mass, which is capable of supporting the heaviest traffic, according to reports.

— Elderly persons tell surprising stories of the old-time fear of giving cold water to fever patients. This has long since passed, and they now are permitted to drink freely. Still further than this, starting principally from the theoretical consideration that the poisonous products of the action of disease-producing bacteria in the infectious diseases may be got rid of by washing them out, a few physicians have tried the administration of drinks in very great quantities, — much more than the patients would voluntarily call for. For instance, Dr. Valentini of Königsberg (Deutsche Med. Woch., xvii, 914) directs the nurses to give the typhoid-fever patients milk, bouillon, and water in quantities that would appear impracticable if mentioned. In addition to it all he has latterly given 200 grams of sugar of milk dissolved in a litre of water as a food and to increase the diuretic effect. The results, we are told, are surprising. The concentrated renal secretion is diluted and increased and, even at the acme of the disease, its quantity is maintained at much above what is usual in fever. In milder cases the diuresis is kept somewhat above the normal. The patients were more comfortable than before the beginning of the treatment, and all the cases terminated favorably.

— Dr. Ermling contributes to a recent number of *Globus* an interesting paper on the Nurhagi of Sardinia. There are said to be more than 3,000 of these prehistoric buildings in the island. They are almost all in fertile districts, and are built in groups which are separated from one another by wide and generally barren spaces. According to many archæologists, the Nurhagi were tombs; but the late Canon Spano, in his "Memoria sopra i Nurhagi di Sardegna," published in 1854, contended that they were dwellings and places of refuge, and this view is accepted by Dr. Ermling. In a trench closed with asphalt, under the ruins of a Nurhage near Teti, various bronze statuettes, swords, spear-heads, and axes were discovered lately by shepherds. These treasures, according to *Nature*, are now in the museum of M. Gouin, a Frenchman, in Cagliari. Some of the objects have been analyzed, and it has been found that the chemical composition of the bronze statuettes is not the same as that of the axes. The statuettes consist of copper 90 3, tin 7.4, iron 2.1; the axes, of copper 87.4, tin 12.0, lead 0.5, with traces of iron.

— Mr. James Shaw writes to *Nature* as follows: "I labor under the peculiar inconvenience of having a right eye of normal power and a short-sighted left eye. The numerals on the face of a clock five-eighths of an inch high are visible to the right eye at twelve feet distant; but in order to discern them as clearly with my left eye I require to bring that organ of vision as near to the figures as eight inches. On looking at my gold chain hanging on my breast in daylight and with both eyes, the chain colored yellow and towards the left, is perceived by the right eye, while a steely blue chain, another, yet the same, is perceived about an inch to the right and a little higher up. By artificial light the same phenomenon presents itself, but the difference of color is not so apparent; the yellow to the right is only dimmer. Again, when a page of *Nature* is being read with the short-sighted eye, there ap-

pears, about an inch to the left, part of the same column, small, and the black, under artificial light, like weak purple. The right-hand side of this ghost-like column is lost to the right eye, being commingled with the larger, darker letters seen by the short-sighted left, which cover it like the more recent writing on a palimpsest. Middle life was reached before the discovery was made. These experiences must be gone through with intent, for objects generally being perceived altogether with the right eye, all that the left seems good for is to supply a little more light. The perception of the difference of color is as good with the one eye as the other, and the short-sighted eye can read smaller type. As the inferior animals, so far as I know, have no habit of peeping or looking with one eye shut and the other open, it occurred to me that this ability might be a limited one. I tried the experiment with school children, and to my surprise found that a few were quite unable to keep one eye shut and the other open at the same time, and a few did it with an effort, making in all about a fourth of the number. Adults were likewise under similar limits, but to a less extent. This may be the reason why the discovery of inequality of vision, as Sir John Herschel remarks, is often made late in life. Indeed, he mentions an elderly person who made the unpleasant discovery that he was altogether blind of an eye."

— The University Extension Conference in Toronto, on Nov. 5–6, led to the establishment of the Canadian Society for the Extension of University Teaching, the organization of which is largely modelled on that of the American Society. The Universities of Ontario and Quebec were thoroughly represented and the leading colleges, normal schools, and high schools of the Dominion sent delegates. President James of the American Society gave the leading address on the evening of Nov. 5, and was present at the different sessions to explain the various questions that arose. The presidents of the new society are Sir Donald A. Smith of Montreal, Chancellor G. W. Allen of Trinity, Chancellor Edward Lake of Toronto University, Professor Goldwin Smith, Chancellor Sanford Fleming of Queen's, and Abbé Laflamme of Laval University. The secretary is Mr. William Houston of Toronto, the well-known economist, to whom is due in large measure the success of the meeting and the establishment of the society.

— The following is an abstract of a bulletin on "The Hessian Fly," recently published by Professor F. M. Webster, consulting entomologist to the Ohio experiment station. This fly is a small, dark-colored, two-winged fly, about one-eighth of an inch long and shaped much like the wheat midge, both belonging to the same order and family of insects. The male is more slender than the female, which, when full of eggs, slightly resembles a diminutive mosquito moderately full of blood. The life of the insect in the adult stage is short, the male dying soon after pairing and the female soon after oviposition. The egg is about one-fiftieth of an inch long, of a dull reddish color. The larva or maggot is, when first hatched, of a nearly white color, with a tinge of red, but later they are very light green, clouded with white. The pupa is formed under cover of the puparium, which last is known as the "flaxseed" stage, on account of its resemblance to a flaxseed in form and color. The insect is best known under this name and in this stage of development. The eggs are deposited by the female very soon after she hatches from the "flaxseed," as the rule, on the upper side of the leaf. This task is finished in a few days, after which she dies. The young hatching from the egg works its way downward, beneath the sheath to its base. In the fall this is just above the roots below ground, but in spring they do not go below ground, as a rule, but stop at or near one of the lower joints. It is proper to say that this pest suffers much from the attacks of several minute parasites, which attack and destroy it in both the egg and larval or maggot stage. There are two annual attacks of the Hessian fly, one appearing in the fall and the other in the spring. With the fall brood the time of depositing the eggs varies with the latitude, the farther north the locality the earlier the time of egg laying. In northern Ohio the eggs are deposited early in September, while in the southern part this is delayed until probably early in October, the grain over the territory between these points being stocked with eggs between the dates given. Whether there is the same variation with respect to the spring brood is not known. The eggs at this season are deposited in April and May, the insect usually reaching the "flaxseed" stage before harvest and remaining through July and August in the stubble. The preventive measures may be noticed as follows: Sowing at the proper time; burning of the stubble; rotation of crops; sowing long, narrow plats in late summer as baits; applying quick-acting fertilizers to seriously infested fields in the fall in order to encourage attacked plants to throw up fresh tillers, and to increase the vigor of these that they may make sufficient growth to withstand the winter. After the fly has gained possession of a field Professor Webster knows of no application that can be made which will destroy it. Doubtless pasturing the field, if early sown, will often result in reducing the numbers of the pest, besides giving to the ground that compact, pulverized nature which it should have had at first. No doubt many larvæ and "flaxseeds" by this means would be crushed, but very few would enter into the food of the animals grazing thereon, unless the plants were pulled up both stem and roots. Sheep are probably the best animals to turn on wheat as they are not heavy enough to injure plants by trampling.

— The work of university extension has been undertaken in Australia by the University of Melbourne. There are at present nineteen lecturers on the list whose courses include a wide range of subjects in the departments of history, literature, art, philosophy, and science. It is claimed that while the work will suffer under certain disadvantages as compared with England, the rural population being scantier and less compact, and the means of communication not so good, the average Victorian has greater means and more leisure at his disposal than the average Englishman. Certainly the Australians are not a people lacking either in energy or in quickness to avail themselves of whatever advantages may come within their reach. It is interesting to note another illustration of the analogy between Australian and American development in the adoption of the short course of six lectures. With the success of the work, however, the tendency to longer courses will certainly appear in Australia as it has already done in the United States.

— On Dec. 2, Mr. G. H. Robertson read before the London Society of Arts a paper on "Secondary," or, as he prefers to call them, "Reversible Batteries," which is reported in *Engineering*. After giving the history of their invention and improvement, he reviewed the chemical changes which take place in the acid, this being a subject to which he has devoted very great attention. Planté considered that the variations in electromotive force were due to the formation of peroxides in the acid. Messrs. Gladstone and Tribe, testing the acid between the plates, always found traces of something which decolorized permanganate, and might therefore be hydrogen dioxide or ozone. In 1878 Berthelot discovered persulphuric acid ($H_2S_2O_8$), and showed it was the primary product of the electrolysis of sulphuric acid solution, and that the hydrogen dioxide present in sulphuric acid after electrolysis is due to the action of that body on the acid. Persulphuric acid begins to decompose as soon as the current is stopped, and its decomposition is accompanied by the formation of hydrogen dioxide, unless the acid is too dilute. Mr. Robertson found that when cells were tested they contained active oxygen, due to the presence of persulphuric acid and peroxide of hydrogen in varying proportions. During charge persulphuric acid is the main constituent; during discharge the quantity of hydrogen dioxide gradually increases; while in a cell that has been at rest some time there is very little except hydrogen dioxide to be found. Active oxygen forms at once on the passage of the current, decreases slightly, and then increases to a little above its first value. Starting either charge or discharge always causes initial increase, except in the case of cells which have been long idle, when there is a diminution due to the decomposition of the excess of hydrogen dioxide in the acid. Persulphuric acid does not itself reduce peroxide of lead, but it forms hydrogen dioxide on standing, and this is capable either of oxidizing the lead plate to litharge, or of reducing the peroxide plate to the same substance. In each case the litharge is converted into sulphate by the sulphuric acid. This

appears to explain the well-known deleterious effect of rest on a cell. In an ordinary good cell of 45 pints capacity there is sufficient active oxygen to convert 3.25 to 7.5 grammes of peroxide of lead into sulphate, or to undo the work of one or two ampère-hours charge. At each reversal, however, the peroxides are broken up, but if the cells stand idle the plates get sulphated, and the amount of active oxygen formed in the next passage of the current shows a marked increase. In sodium sulphate cells the active oxygen is usually less than in plain cells and the hydrogen dioxide always so. The variations in electromotive force appear to depend on which plate hydrogen dioxide is formed at. When present at the peroxide plate it causes a rise, but when diffused through the acid and present at the lead plate it causes a lowering.

— At the Methodist Chinese Mission, 205 West 14th Street, New York, a writer in *Our Language* for December states that he witnessed on Nov. 8 a demonstration of the value of phonetic spelling as a stepping stone in teaching pupils to read ordinary English. A pupil of the school, who had received five lessons a week for three weeks, was examined and found able to read seventy-four pages of "Harper's First Reader." He had been taught by Mr. Knoflach, using "Sound-English" at first, and passing from this into the ordinary print. The Chinaman's mission teacher stated that her pupil could neither read nor speak English, except three or four short phrases, when Mr. Knoflach took him in hand, and she, together with several of the other teachers, expressed much wonder and delight at the achievement. The man also read the first eight chapters of Genesis. The teaching is especially difficult in such a case as this, for the pupil cannot understand the instructor's explanations; besides, several sounds in English are strange to Chinese vocal organs. Mr. Knoflach has since begun to teach German and Italian children to read English by the same means, in a New York charity school.

— Nossilof, who has devoted so much time to the exploration of Nova Zembla, spent last winter at the western entrance of Mathew Strait, in a house specially constructed after his own plans and brought from Archangel. Up to November M. Nossilof was able to make excursions into the Kara Sea, collecting birds and animals, surveying the coast, and taking soundings in the sea. The winter was unusually stormy, and the sea remained open until spring. Torrents of rain fell, so that the country was covered with a coating of ice, and the reindeer perished from hunger; hundreds of seals were frozen on the ice, and fish were thrown up in heaps on the shore. Changes of temperature occurred with great suddenness: from —31° F. the thermometer rose to +37° F. in a few hours. The spring and summer were correspondingly severe, and the temperature did not rise above 41° F. up to the end of July. Nevertheless, the scientific work of the expedition was carried on without interruption, and large zoological collections were made (*Scottish Geographical Magazine*, December). This is the third winter M. Nossilof has spent in Nova Zembla. His next journey will be to the peninsula of Yalmal.

— The *Abhandlungen* of the Royal Prussian Meteorological Institute (Bd i., No. 4, 1891) contain the first part of a treatise on the climate of Berlin, referring to rainfall and thunderstorms. Berlin possesses a long series of observations, commencing with the beginning of the eighteenth century, but in this investigation some of the earlier observations have not been used. The subjects treated, as we learn from *Nature*, are: (1) The amount of rainfall, the annual mean being given as 23 inches. The extreme values varied from 14.26 inches in 1887 to 30 inches in 1882. The wettest months were June and July, yielding together 24 per cent of the annual amount. (2) Rain frequency. The average number of days on which 0.08 of an inch fell was 152. The months of greatest rainfall frequency were November and December. (3) Hail and soft hail (*Graupel*). The former occurred on 2 to 3 days and the latter on 3 to 4 days in each year, and mostly in the months of May, June, and July. (4) Snow. A Berlin winter numbers on an average 33 snowy days. The distribution according to months is very curious: snow does not occur most frequently in the coldest months; it falls as often in March as in December. It lies on the ground 49 days on an average. (5) Intensity of rainfall. Daily falls of more than 2 inches are quite exceptional, and of 1½ inches are not frequent. The greatest fall was 1.86 inches in 1½ hours. (6) Wet and dry periods. Attention is more particularly given to periods of short duration; wet periods of five or more days are fewer than dry periods of similar length; the former average 7 5 and the latter 13.2 per year. (7) Thunderstorms. Berlin enjoys comparative immunity from thunderstorms, as they occur on an average only 15 days in the year, about half of them being in June and July. This valuable discussion has been carried out by Professor G. Hellmann.

— The external part of the laboratory which is being built in the Paris Museum of Natural History for Professor Chauveau, from the designs provided by him, is now finished. This laboratory will be used only for original research in physiology and bacteriology, and when completed will be the finest laboratory in France. But the Museum, according to *Nature*, is deeply in debt, and this may cause some delay.

— At the late International Congress of Hygiene and Demography, in Section 4, which was concerned with the Hygiene of Infancy and School-life, a resolution was passed in favor of the teaching of upright penmanship or vertical writing, on the ground that spinal curvature and short sight are caused by the faulty position of the youthful student, which is necessitated by slope of the letters. We can all of us remember, says *Lancet*, the trouble of learning to write, and the mental and physical toil which the making of our first pothooks and hangers involved. The number of muscles put in action when a person is writing is prodigious, and it is probable that in beginners every muscle of the body must yield its assent before the graphic symbols trickle from the pen. The fingers, wrist, elbow, and shoulder must all be held steady. The spine must be rigid and fixed below as well as above. The pelvis must be firm, and to this end the child often gets a support by its feet from the legs of the chair. The thorax is more or less rigid, and its movements are determined more by the work of the hand than the respiratory needs. Lastly, the knit brows and protruding tongue are unconscious muscular acts which serve to mark the effort, both of body and mind, which the child undergoes when learning to write. It is notorious that in writing our individuality asserts itself in spite of the pedagogue. We are taught certain rules for sitting at the desk and holding the pen, which we ultimately learn to neglect, and finally write in a fashion of our own. The great drawback of writing as an exercise for children is the fact that it involves one-half of the body only, and the necessity of fixing the spinal column causes the child instinctively to loll upon its left side while the right arm is working. To what extent the asymmetry of posture is caused by the fashion of sloping the letters it would be difficult to say, but there can be no doubt that the writing master ought to carefully watch the attitude of the child and endeavor to make it sit square to the desk and maintain the spinal column vertical. Every child should have a footstool to give firm support to the feet, and the seat should not be slippery, so that the fixation of the pelvis may be easy. Vertical writing is very legible, and if it diminishes to any extent the tendency to sit "lop-sided," it ought to be encouraged. The true remedy for the evils produced by learning to write seems to us to be to teach the child to use both hands, and to practise alternately with either hand. Vertical writing lends itself more readily to ambi-dexterity than does sloping writing, and there can be no doubt that a clerk who could write with equal facility with either hand, and could rest one side of the body while the other was working, would be little liable to writer's cramp and similar troubles. Seeing how enormous is the muscular effort involved in giving the hand sufficient steadiness, and that the brain fag is scarcely less than the muscle fag, it goes without saying that writing lessons should at first be of very short duration. Ten minutes with each hand ought to amply suffice.

— Mr. P. H. Rolfs, recently connected with the Iowa Agricultural College, Ames, Ia., has been appointed botanist and entomologist of the Florida Agricultural Experiment Station at Lake City, Fla.

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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The Exchange" column is likewise open.

MASTODON REMAINS ON NEW YORK ISLAND.

ON Nov. 27 last Lieut.-Col. Gillespie of the Engineers' Department, U.S.A., addressed a letter to the American Museum of Natural History, offering the remains of a mastodon tusk which had been found during the excavation for the Harlem Ship Canal at the upper end of New York Island. Col. Gillespie informs me that the specimen was found at a depth of sixteen feet below mean low-water, at the eastern end of Dyckman's Creek, at its junction with the Harlem River.

The portion of the tusk preserved and received at the museum is nearly three feet long, and has a diameter of seven and a half inches full, at its largest part; being the upper or socket end of the tusk, and is well preserved, although much shattered by drying and rough handling by the workmen before it came to the attention of the engineers in charge of the work.

A few days after the tusk was received at the museum I visited the excavation, and, by the courtesy of the engineers in charge, Messrs. A. Doerflinger and J. McC. Taylor, learned the particulars of its occurrence.

The excavation at this point is through the salt meadow of the Harlem River, showing from four to six feet of meadow sod and silt filled with the roots of the meadow grass; below this there is a deep bed of incipient peat, of which, at the spot where the tusk was found, there was fully twelve feet; next below comes a bed of sandy clay of very variable thickness, but at the spot in question measuring only eighteen or twenty inches in thickness. This clay rests immediately on the submerged slope of the dolomitic limestone ridge which forms the upper end of Manhattan Island, and extends northward beyond the Spuyten Duyvil Creek.

The tusk was found imbedded in the peat with the socket or "butt" end down, and slightly entering the sand, the shaft being in the peat and at an angle of about seventy degrees to the horizontal, showing that it had settled through the peat until it came in contact with the sand.

From the indications furnished by the conditions of its occurrence I should conclude that the tusk had not been transported from any other locality after the death of the animal, as there is no abrasion shown on its surface. Moreover, the peat in which it was imbedded is in the condition of its original formation, is clean and unmixed with any foreign matter, being entirely of vegetable origin; and contains quantities of seeds, apparently of Carices, or sedges, and grasses, as well as a few nutlets of some bush or shrub not yet determined, and examples of the elytra of beetles. At the top of the peat occur numbers of the stumps and roots of forest trees and fragments of wood. No evidence whatever is found of any marine substance below the roots of marsh grass, not a vestige of any kind of mollusks, marine or fresh water, can be detected, although now living and abundant in the salt water at the surface. The sandy clay between the peat and the surface of the limestone appears to me to be the result, principally, of the decomposition of the limestone in place, and not transported sand. Glacial markings are discoverable on the surface of the limestone a short distance south of the locality, where the soil has protected it from the action of the weather, but where the ledge has been uncovered by the removal of the peat and sand, it shows a deeply rotted surface covered by the sand.

Dyckman's Creek was an artificially excavated channel, made about 1818, for the purposes of a tide mill, through a natural depression at that point, and not a natural stream; consequently, it could have had no agency in the transportation of the tusk; and it seems probable that the animal to which the tusk once belonged either died near the spot, or by some accidental injury had it broken from its socket near where it was found.

The exact location of its occurrence is in the canal, about fifteen feet from its northern side, and about ten feet west of the centre of Broadway.

In April, 1885, Elisha A. Howland, then principal of grammar school No. 68, at 128th Street, between 6th and 7th Avenues, brought and donated to the museum the lower extremity of a mastodon tusk, nearly fifteen inches long by four in its greatest diameter, which had been found shortly before at Inwood, N.Y., while cutting a ditch through a peat bed near the Presbyterian Church at that place. This fragment shows fresh breaking at the upper end, and was undoubtedly much longer when first found.

R. P. W.

CO-OPERATIVE OBSERVATION OF THE SO-CALLED LUMINOUS CLOUDS.[1]

SINCE 1885 curious cloud formations have been seen on summer nights in both the northern and southern hemispheres, in evident connection with those phenomena which followed the great volcanic eruption at Krakatoa. The intense brightness of these formations, considering the position of the sun, denoted that they were situated very far above the earth's surface. Probably these clouds consisted of erupted particles thrown to a very great height and there illuminated on summer nights by the sun.

These cloud-like formations, commonly called luminous clouds are extremely interesting, both on account of the extraordinary height at which they have for years been moving above the surface of the earth (more than eighty kilometres) and of the movements themselves. A very important point about these clouds is that they are — so far as we yet know — visible in each hemisphere only in the summer. It is the more important that these phenomena should be carefully

[1] From Nature, Dec. 3.

and widely observed, since it is believed that they are gradually breaking up, so that probably in a very few years no distinct traces of them may remain (see also O. Jesse on so-called luminous clouds, in the journal *Himmel und Erde*, vol. i., p. 263).

Photographic results of the researches of O. Jesse are given in Part xl. of the Transactions of the Berlin Academy of Science for 1890, and Part xxvi. for 1891. It is very desirable that such photographs should be taken in as many different localities as possible, because from them we get the surest basis for consideration of the situation and movements of the clouds. But valuable aid may be given by the co-operation of numerous observers in various regions of the earth without the aid of any apparatus.

The principal points upon which stress is to be laid in this inquiry are: —

(1) By what method can the so-called luminous clouds be most surely distinguished from others, especially from the ordinary cirrus cloud?

Clouds or cloud-like formations which after sunset and before sunrise stand out brightly from the dark ground of the heavens, no earthly or unearthly sources of light being present on the horizon, can only produce this effect by means of their own light or else by light which they receive directly or indirectly from the sun or moon below the horizon.

Cloud-like formations which shine at night by their own light have doubtless been formerly observed above the surface of the earth. To these formations belong not only thunder and lightning clouds, but also some polar light and meteoric phenomena.

But the so-called luminous clouds do not belong to the various species of self-luminous clouds, for finer measurements of their light are wanting, besides which the fact that they are only seen within the zone of twilight proves that the sun below the horizon is the principal source of their light.

It is well known that there are clouds within this twilight zone which resemble high mountain peaks, and which in the first stages of twilight shine in the light of the sun, though the latter is below the horizon of the observer. It is easy to determine the relation between the position of the sun below the horizon, and the height of those layers of atmosphere which receive the sun's light and reflect it.

But the laws which govern the whole course of twilight are modified when the distribution of the sunlight-reflecting particles in the atmosphere is altered to any great extent. If, for instance, numerous minute atoms produced by volcanic eruption or by the breaking-up of meteoric bodies find their way into those heights above the earth's surface in which usually the gaseous elements of the atmosphere are present in a very scattered form, it may happen that such a layer, which reflects the sunlight very strongly, may curiously alter the course of the twilight.

So long after sunset as the masses of air beneath such a layer receive direct light from the sun and reflect it, the observer will not distinguish any deviation from the usual course of twilight. But as soon as the further sinking of the setting sun gradually deprives the lower layers of air of the direct light, the higher layer of dust still receiving light from the sun stands out in astonishing brightness, the particles of dust having strong reflecting power, thus giving to the close of twilight the curious effect of the sudden appearance of shining clouds on the broad surface of the heavens.

The phenomena of the luminous clouds corresponded when first perceived to the above description. At present they are no longer so strong or so extensive, but only form thin whitish-blue shining veils, similar in form to the so-called cirrus or feather-clouds, occupying but a comparatively small part of the floor of the heavens inside the twilight segment, and in our zone mostly near the horizon. Probably, the layers are now so thin that very near and exactly above us they can no longer be seen.

From the above considerations, it is clear in what way these clouds differ from those situated nearer to us, and especially from the cirrus clouds floating scarcely more than thirteen kilometres above the earth's surface. All these lower clouds appear in the later twilight gray and shadowy on a light ground, because the layers of atmosphere above them are the chief source of the remaining twilight. The luminous clouds differ too in shape and structure from the other kinds of clouds.

We must guard, however, against the error of mistaking cirrus for luminous clouds, when, in exceptional cases, the former look very bright, in consequence of receiving light either directly or indirectly from the moon or other sources. In this case, the question is decided by the relatively high degree of stability in position and form of the very high and distant luminous clouds, as ordinary clouds lie lower and nearer, and show much more rapid changes of position.

(2) When convinced of beholding so-called luminous clouds, to what points shall attention be especially directed, and what simple measurements of place, time, form, etc., shall be carried out in order to aid most usefully in the inquiry?

In answering this question, we will first consider those methods of research in which the observer can obtain no instrumental aid, except only a watch, which should be a sufficiently good timekeeper to estimate the time of observation to one minute, when compared with the correct time within eight or twelve hours after the observation.

Such simple observations are the more useful, since it frequently happens that in the well-fitted up and prepared stations, observation of the phenomena is prevented by bad weather, or else that the phenomena stretch over too large an extent of the earth's surface to be included in an organized series of observations. The farther the stations are apart, the more valuable are the most simple methods. For instance, in order to get corresponding photographic observations from two stations, thirty-five kilometres apart, such as Berlin and Nauen, the most rigid exactness, both as to time and place, must be observed.

If, however, observations are taken in East Prussia and in the Rhine province respectively, a from twenty to thirty times larger margin of difference as to time and place can be allowed than in the foregoing case, without in any way lessening the value of the result.

So, if without preparation and instruments to hand an observer believes he beholds luminous clouds, he must not imagine that he can render no service to science by examining them closely, for very possibly the most simple method may, taken in conjunction with other similar observations, prove to be of the greatest service.

It is desirable, too, to look out for luminous clouds at all seasons of the year, though, so far, they have only been seen in summer. In the northern hemisphere they have only been seen from the end of May to the beginning of August, with greatest frequency and brightness in the month of July.

During these weeks, usually two stars are seen simul-

taneously with the luminous clouds, a star of the first magnitude, Capella, and a star of the same constellation, of the second magnitude, β Aurigæ.

The brighter of the two stars, which is characteristic of summer nights, in the northern horizon, sets towards the end of June soon after eleven, and towards the middle of July before ten, on account of the northerly direction of the meridian, and, in North Germany, at a distance from the horizon of ten to twelve diameters of the full moon. At almost as great a distance from this bright star, and at a not very different distance from the horizon, the second magnitude star follows towards the west.

By estimating the distances and directions of these two stars, an excellent means is afforded of determining the outlines of a group of luminous clouds. It is only necessary to determine how great the distance of a certain part of the outline of the cloud group is from one or the other star, and in what direction this line lies with regard to one or the other star, or how far the line in question is above or below the prolongation of the connecting line of the two stars. A simple drawing of the course of the outlines and their situation with regard to the two stars is useful, even when it cannot be completed on the spot but must be finished from memory. The time at which the drawing was made should be noted within one half-minute.

If the group of clouds should be so far from the above-mentioned two stars as to make the determinations inexact, it is advisable to determine the outlines of the clouds for a certain time in the following way. Take up a position from which the outlines of houses, trees, etc., can be seen close to the position of the clouds, and fix thus the relative position of these earthly objects to the position of the clouds by a simple drawing, describing the spot from which the observation is made in such a manner that the place occupied by the head of the observer can be found again. The lines drawn from the position of the observer to the outlines of the earthly objects, and the resulting localization of the outline of the clouds in the heavens can then be determined at once by means of simple instruments for measuring angles, or on succeeding nights by the aid of a good star chart.

It is necessary to verify the exact point of time of these observations by comparison of the watch used with the time at a telegraph office, and correction of any errors should be made to the fraction of a minute.

In communicating these observations, the exact place at which they have been made must be accurately described.

Should a complete observation be impossible, owing to the time during which the luminous clouds are visible being too short for careful measurements and drawings or to any other cause, the observer should nevertheless communicate briefly to the Society of Friends of Astronomy and Cosmic Physics that he has seen what he believes from the foregoing considerations to be luminous clouds from a certain place, in a certain direction in the heavens, and within a certain quarter-hour.

The peculiar movements hitherto observed of the clouds in question lead to the suggestion that perhaps a period consisting of several days exists, within which one and the same group of clouds is visible at the same hour from the same place, other conditions of the heavens being favorable. Every communication as to these phenomena will be valuable in the decision of this important point, which it has hitherto been impossible to settle, owing to the uncertainty of the weather and the fewness of the observers.

Those co-operating in our branch of research who are in possession of astronomical, photographic, or other physical apparatus, will of course be able to give more exact details as to place, movement, and continuation of the luminous clouds.

Suggestions for these observations cannot be given so briefly and simply; but for the sake of full and complete agreement between different observers, especially as to the point of time selected for taking photographs and measurements, members of the Society of Astronomy and Cosmic Physics are invited to communicate with O. Jesse, Steglitz bei Berlin, Albrechtsstrasse 30. This course would also be advisable in the close optical examination of the clouds with regard to the peculiar changes in strength of light and the degree and kind of self-luminosity which they perhaps send out together with the reflected sunlight.

In the night from June 25-26 of this year the summer reappearance of the luminous clouds was observed very brightly from Berlin and the neighborhood.

More detailed particulars on the whole subject of inquiry are contained in a small paper by W. Foerster, which has been sent to all the members of the Society of Friends of Astronomy and Cosmic Physics.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

A Bowlder of Copper and Glacial Striæ in Central Missouri

A FEW weeks ago there was found near this place a small bowlder, or nugget, of copper, weighing twenty-three pounds. It is eleven inches long, six inches wide, and three inches thick at thickest part. It is almost entirely pure copper, but with a thin crust of the green carbonate all over it except at one end, where there is a slight depression, two inches wide, in which there is a thicker coat — somewhat crystalline — of the blue carbonate. In some crevices in it I found fragments of a coarse red sandstone.

This is a region of impure limestone and shale, of the coal measures, with no trace of copper. But all over the surface of the country in this vicinity pebbles and small bowlders (sometimes two or three feet thick) of granite, quartzite, etc., are found.

In at least one locality near here there are glacial(?) striæ upon the surface rocks. These are on the top of a bluff on the Missouri River and about twelve miles south-west of the place where the copper was found. The top of this bluff is at least a hundred and fifty feet above the present level of the river. Its upper layer of rock is of Burlington limestone, which is polished and much marked with striæ. These striæ are north and south in direction — nearly parallel with the river at that point.

Taking all these things together, I think my piece of copper is from the Lake Superior region and was brought here by a glacier. A geologist of note, to whom I reported the find, says, "It is undoubtedly of glacial origin, and probably from Michigan."

While thoroughly satisfied that this piece of copper is of glacial origin, I am not so decided in the opinion that the striæ referred to were made by a glacier rather than by floating ice for the following reasons:

The place where the striæ are found is at the summit of an anticline which can be plainly traced in the exposed edges of the bluffs for several miles. Standing on the summit of this anticline, and looking across the river, you can see, about two miles distant, the continuation of the same anticlinal ridge. This also presents a bluff towards the river. Between the two bluffs is the flat bottom land along the river and the river itself. Now it seems likely that this anticline was lifted up late in time, and may have temporarily dammed or obstructed the flow of the river — then much larger than now. Or an ice gorge in the river at this

point may have been the obstruction. At that time the water, filled with floating ice, may have made the striæ as it flowed over the top of this dam; until finally it cut a chasm through the obstruction.

Another fact suggesting the same probability is that from this anticline for many miles up the river there are considerable Loess deposits. These may have been made before the obstruction was was cut through.

But while the striæ at this place might be thus accounted for, this would give no sufficient explanation of the presence of the bowlders. etc., scattered over these hills many miles from the river and several hundred feet above its bed. In fact there are now three or four feet of clay or soil overlaying the very rocks which have the supposed glacial scratches on them, and this clay, etc., has in it pebbles and small bowlders of the same kind as those scattered over the surface of this section.

So, upon the whole, I think bowlders, striæ, and all are of true glacial origin. J. W. KIRKPATRICK.

Fayette, Mo., Dec. 9.

Mexican Featherwork.

"THE most famous surviving specimen is the *standard*, described by Hochstetter, which is now in the Vienna Ethnographical Museum" (*Science*. Dec. 4, p. 311, 2d col., top). This splendid piece of old Mexican featherwork is the subject of special publications by Mrs. Julia Nuttall, entitled "Das Prachtstück altmexicanischer Federarbeit aus der Zeit Montezuma's im Wiener Museum" (Reports of the Dresden Museum, 1887), and "Standard or Headdress" (Archæol. and Ethnol. Papers, Peabody Mus., Harvard, 1888, Vol. I., No. 1). Both these papers are elaborately illustrated and bring forward overwhelming evidence to show that what has hitherto been considered an Aztec standard is really a head decoration. X.

Kansas Mosasaurs.

HITHERTO, no adequate description or figure has ever been published of the complete anatomy, or even of the skull, of any member of the extinct group of reptiles known as the Mosasaurs or Pythonomorpha. Fortunately, however, my able friend Dr. Baur has recently had the opportunity to thoroughly study an excellent specimen of one of the Kansas forms, and his figures and descriptions, when published, will doubtless be of great interest. The University of Kansas has, within recent years, obtained one of the most valuable collections of these animals now extant. Among this material, there is one specimen of especial interest, by reason of its remarkable completeness, consisting, as it does, of skull and connected vertebræ to the tip of the tail, with ribs, extremities, and cartilages in position.

Before briefly describing this specimen, which belongs to a different genus from that studied by Dr. Baur, I may be permitted to offer the following remarks upon the nomenclature of the Kansas forms, based upon larger opportunities than have been enjoyed, I believe, by any other investigator.

The following generic names have been proposed or adopted by various writers for the different forms of these reptiles from the Kansas Cretaceous: *Liodon* Owen, *Platecarpus* Cope, *Clidastes* Cope, *Sironectes* Cope, *Lestosaurus* Marsh, *Tylosaurus* Marsh, *Edestosaurus* Marsh, and *Holosaurus* Marsh. Three genera, only, can be readily and positively distinguished among the material. The names now recognized for these, and with justice, are: *Liodon*, *Platecarpus*, and *Clidastes*. Two others, *Sironectes* and *Holosaurus*, have, possibly some claims for recognition, but the evidence in favor of either is, so far, very weak. *Holosaurus* is not synonymous with *Sironectes*, as affirmed by Cope and followed by Dollo. *Holosaurus* rests almost solely upon a single character, the non-emarginate coracoid; in other respects nothing is known to separate it from *Platecarpus*. In fact, *Platecarpus* itself may possess this very character. That the character was not considered by the author of *Holosaurus* as important is evidenced by the following. In the *American Journal of Science* (Vol. iii., June, 1872, p. 5 of separate) he says: "There is certainly no emargination in the coracoid of *Clidastes*, *Edestosaurus*, and *Baptosaurus*, as specimens in the Yale Museum conclusively prove." A figure of the coracoid of *Clidastes* (*Edestosaurus*) *dispar*, given in the same paper, shows the bone entire. In the same paper in which *Holosaurus* is figured and described (*Amer. Jour. Sci.*, vol. xix., pp. 83–87) a restoration is given of the shoulder girdle of "*Edestosaurus dispar* Marsh," in which the coracoid is very conspicuously seen to be emarginate. That this was not an error on the part of the artist, I can vouch, for the specimen from which the figure was made was collected and restored by myself. There is a lack of consistency here somewhere.

A fuller discussion of the genera and generic characters of the Kansas material, I leave to a future occasion. As there have been more than twice too many generic names given; so, too, it is pretty evident that there is even a greater proportion of synonyms among the specific names. The specific nomenclature is, at present, however, a subject of great intricacy, of which no one is master. Mr. E. C. Case of the State University will shortly publish a paper on this subject.

With these general observations, I will now give a brief description of the specimen above mentioned; a fuller description, with illustrations, will appear later. The specimen is a *Clidastes* (*Edestosaurus*) and, from Mr. Case's studies, probably *C. velox* Marsh, which is apparently the same as the earlier described *C. cineriarum* Cope. The specimen measures, from the tip of the tail to the tip of the rostrum, one hundred and thirty-nine and one-half inches, including altogether one hundred and seventeen vertebræ, the whole regionally divided as follows: skull, seventeen and one-half inches; cervical region, seven vertebræ, eight and one-half inches; costifarous, post-cervical region, thirty-four vertebræ, fifty-four and one-half inches; non-rib or chevron-bearing region, seven vertebræ, eight and one half inches; chevron bearing region, sixty-eight vertebræ, fifty-one and one half inches. All of the cervical vertebræ, save the atlas, have ribs, those of the axis, though, are very small, increasing in the last cervical to about three inches in length. The first to the ninth dorsal, or true thoracic, ribs, those articulating with the cartilaginous sternum through the intervention of cartilaginous ribs, are of nearly equal length, about eight and one-half inches, and are moderately curved. The eleventh dorsal rib is but four inches long, and thence to the thirty-fifth or last, they decrease gradually to about two inches. The rib-bearing processes, as well as the vertebræ themselves, do not differ much throughout the series. The longest costal cartilage preserved does not measure over four inches; this will give, with the sternum and vertebræ, a total circumference of the thorax not exceeding thirty inches.

Immediately following the last costiferous vertebra, are seven vertebræ with elongate transverse processes, and without chevrons. From the position of the pelvis, it was evidently attached to the first of these vertebræ, none of which can be properly called lumbar. With the first chevron-bearing vertebra, the transverse processes begin to decrease in length, and finally disappear in the twenty-fifth or twenty-sixth.

The tail is elongate, slender, and compressed, the spines and chevrons having their greatest length only about one foot from the extremity, where the tail measures nearly six inches in height.

Of the paddles little need be said. The hind pair was decidedly smaller and less strong than the fore pair, the latter having an outstretched expanse of about thirty inches.

As a whole, this, one of the most specialized species of the most specialized genus of known extinct or recent lizards, was most marvellously serpentine and slender in its build, with an elongate, flattened, pointed head, short neck, very slender body, long, lithe, and vertically flattened tail, small but broad and strong paddle-like limbs. It is doubtful whether there was ever another vertebrated animal so admirably adapted for rapid and varied movements through the water. Though the smallest of the Mosasaurs, it was by far the most graceful in its proportions, the most delicate and exquisitely constructed in its details.

It is certain that none of the Kansas forms of this order were covered with bony scutes, as described by Marsh, the bones so described being, undoubtedly, sclerotic plates.

S. W. WILLISTON.

University of Kansas, Dec. 1.

Autumn Colorations.

IN investigating this subject the first question is, What causes the variation in coloration? This may be answered by saying that it is a natural ripening of the leaf, a change in the coloring matter of the leaf called chlorophyl. One botanist has said: "The green matter in the tissue of a leaf is composed of two colors, red and blue. When the sap ceases to flow in the fall, and the natural growth of the tree ceases, oxidation of the tissue takes place. Under certain conditions, the green of the leaf changes to red; under different conditions, it takes on a yellow or brown tint. This difference in color is due to the difference in combination of the original constituents of the green tissue, and to the varying conditions of climate, exposure, and soil. A dry, cold climate produces more brilliant foliage than one that is damp and warm."

It is said by some who have visited England that in many places the ivy, so much cherished by the English people, is being replaced by our American ivy, Ampelopsis quinquefolia, although in that climate it does not take on as beautiful tints as it does in this country, but yet is far ahead of the English ivy. Another botanist, who has visited southern Germany and Switzerland, says that our American ivy is used very extensively in that country for decorating all sorts of buildings, and that the leaves take on more beautiful tints than he ever saw in this country. This may be partially due, however, to the contrast between the vine and the almost universally white color of the buildings in those river valleys.

We may conclude, then, that climate has much, but not all, to do with the variation in coloration for different plants of the same species in the same locality; in fact, different parts of the same plant vary in coloration. Just what makes this difference is an open question. It will be noticed that in many places where one leaf overlaps another that the under leaf is variable in color and that some are variable where they have not been thus immediately overlapped. So we see that in some respects it resembles the coloring of the skin of the apple. For, if an apple naturally red at maturity, is partially covered, the covered portion remains green. So far is this true that if a paper band is put around the apple before it begins to turn the skin will not color under the band. In this way a person can put his initials or his full name upon an apple. This might also be done with the leaf, but the covered portion would not remain green, and might be of the same shades as the exposed portion. This shows that the coloring of the leaf resembles, but is not identical with, that of the apple. The same may be said with reference to the grape. It has been proven time and again that the grape colors fully as well partially or completely covered as when exposed and, too, to just the same color. This is probably due to the fact that the grape skin itself is nearly transparent and the coloring matter is in the pulp immediately next it. The coloring of the leaf resembles these sorts of coloring more than it does the coloring of flowers. For, if a rose be naturally red, it is thought, I believe, that it will be brighter red when fully exposed.

Just here we might suggest that by propagating from individual plants that bear very bright, highly-colored leaves, in a few generations it might be possible to get a tree the leaves of which would be much brighter than the one with which we started.

The general brightness of the coloring of the leaves probably depends largely upon the weather during the time of the ripening of the leaves. This present autumn of 1891 is a poor season for bright colorations in the vicinity of Columbus, Ohio, at least. This may be partially due to the dry weather late in September and early in October.

It would require careful observation on particular plants for a number of years to prove that the weather has the greatest influence. Two plants in particular may be noticed. One is a Japanese species of Ampelopsis on the west side of a brick building. Last autumn the leaves showed great variation in color, making the vine attractive, but this autumn the leaves turn brown and dry up on the vine, and are rather unsightly. The other is a small tree, generally known as "sweet gum," or "American liquid-amber" (L. styraciflua), standing in an exposed position. Last autumn the tree showed great variation in coloration, but this autumn nearly all the leaves turn a dull yellow or brown.

By referring to my diary, I find that in 1890, from Sept. 15 to Oct. 31, there are fifteen days where the weather is recorded as more or less rainy, namely, Sept. 26, 27, Oct. 4, 5, 11, 14, 15, 16, 25, 26, 28, 29, 30, 31; while for the same time in 1891 only seven days are recorded as more or less rainy, namely, Sept. 30, Oct. 4, 6, 14, 18, 19, 20. We may infer from this that wet weather makes bright colored leaves. Jack Frost probably plays his role, and the food of the plant in all probability is an agent in the matter. However, even this fall our trees and shrubs are affording us many specimens of Nature's handiwork worthy of the highest admiration. Dame Nature does not venture to denude all her trees and shrubs without making some to please the eye of man.

This leads us to the question, Is this all mere chance, or is it done for a purpose? In the case of the coloring of the fruits and flowers, it is evident that it is for the reproduction and distribution of the species. But in this case it can scarcely be for either of these purposes. If it is for the protection of birds or insects by resemblance, it serves its purpose very poorly indeed. However, let the cause be what it may, let the purpose be what it may, we always enjoy them, and thus they serve a purpose.

It is surprising how little attention our authors have given to this subject. They have found "sermons in stones and books in running brooks." Is there not enough of beauty in it to give a poet the inspiration, if that is what is wanting? One poet has said,—

> "Heaped in the hollows of the grove,
> The withered leaves lie dead;
> They rustle to the eddying gust,
> And to the rabbit's tread."

Longfellow's words are familiar to all:—

> "The day is cold and dark and dreary;
> It rains, and the wind is never weary.
> The vine still clings to the mouldering wall,
> And at every gust the dead leaves fall,
> And the day is dark and dreary."

We do not find even an allusion to the beautiful coloring of the leaves no more than if they were always brown and sear.

Lastly, we might ask,—

> How might not the trees have been made?
> Intransplantable by shovel or spade,
> Not one twig on a leafy bower,
> Blooming in beauty or bearing a flower;
> Not one leaf changing its hue
> To blend so beautifully with heaven's own blue,
> Not one form to please the eye
> While towering upward toward the sky.

E. E. BOGUE.

Ohio State University, Columbus, O., Nov. 11.

Beech-Tree Struck by Lightning.

I SEND you an additional note on the beech-tree struck by lightning in July (*Science*, Aug. 11). The tree in question was one of a group of four beech trees and one ash tree, it was an old tree and only in half leaf at the time. It has since withered almost entirely. That it really was struck there can be no doubt, as I was sitting at a window within fifty yards of it, and I knew by the sound that something had been struck, as the report was sharp and sudden, not reverberating, and was simultaneous with the flash, and, upon going out immediately afterwards, I found the upper part of the trunk and branches freshly bared and the bark strewed at the foot of the tree. T. D.

York, England.

The Crescent Moon with a Star within its Rim.

THERE is one passage in the poem of the "Ancient Mariner" which had always been a puzzle to me until a few years ago, when I observed a phenomenon which I think supplies a satisfactory explanation of the meaning of the author. The lines referred to are those in which the crescent moon is described as having a star within its rim. I was in the south of England at the time, and the phenomenon which I saw was as follows: One clear evening,

when the moon was in the first quarter, I observed a bright spot resembling a small star or planet upon the shaded surface of the moon at a considerable distance from the illuminated portion of the satellite. This I have no doubt was due to the beams of the sun being reflected from the summit of one of the higher peaks before they had illuminated the surrounding country. I have no doubt the passage in question was suggested to the mind of the author by his having been witness of some similar phenomenon, although I have never heard of it being visible to the unaided eye. T. D.

York, England.

BOOK-REVIEWS.

Masterpieces of American Literature, with Biographical Sketches. Boston, Houghton, Mifflin, & Co. 12°.

THIS book was prepared at the suggestion of the Boston school authorities, and is designed both as a reading book and as an introduction to American literature. The authors represented are thirteen in number, including Franklin, Irving, Whittier, Lowell, and others, and the selections embrace a variety of articles in many departments of literature, both in prose and in verse. The selections are longer than those in ordinary reading books, the whole of Whittier's "Snowbound," for instance, being given, while other authors are represented either by entire works or by long extracts. It is stated in the preface that the Boston school authorities "planned the book and approved every selection;" but, if they did, we cannot think they are to be wholly commended as judges of literature. The book contains too many doggerel verses, while, on the other hand, it presents some striking deficiencies. For instance, there is not in the whole book a single extract from our historians, although it is well known that we have better works to show in history than in any other department of literature. Moreover, there is not a religious article in the book, and very few that are even ethical; so that the collection cannot be regarded as a satisfactory epitome of the best American literature. The omissions are the more to be regretted because ethical and historical works are especially adapted for the instruction of the young. American literature is but a narrow field at best, and gleaners in it cannot afford to neglect any portion of it, least of all that portion from which the most useful moral lessons may be learned. We hope, therefore, that, if ever the book reaches a second edition, some changes will be made in its contents.

AMONG THE PUBLISHERS.

— The third edition of "Electricity, treated Experimentally for the Use of Schools and Students," by Linnæus Cumming, has been published by Messrs. Longmans, Green, & Co. The author has made such additions and alterations as seemed necessary to bring the book up to date.

— John Wiley & Sons have in preparation a "Manual of Experimental Engineering," by Professor R. C. Carpenter of Sibley College.

— Moses King of Boston, the maker of hand-books on various cities, now announces a new work, to be called "King's Handbook of New York City."

— Messrs. Whittaker & Co. have in the press a second edition of Dr. A. B. Griffith's "Treatise on Manures." It is a little more than two years since the work appeared. Fifty pages of new matter have been added.

— The January number of *Scribner's Magazine* marks the beginning of the sixth year and eleventh volume of a periodical which has already attained a circulation of more than 140,000 copies monthly.

— D. Appleton & Co. have under way a subscription-book of considerable importance, edited by Professor Shaler of Harvard. It is to be a general review of the America of to-day based upon the reports of the last census. The contributions to this volume will be by experts and men of high standing in the profession for which they speak.

— The next volumes of Swan, Sonnenschein, & Co's Social Science Series will be "Poverty, Its Genesis and Exodus," by J. G. Godard, and "The Trade Policy of Imperial Federation," by Maurice H. Harvey, who lately wrote an article on the subject in the *Asiatic Quarterly Review*. A translation of the new book of M. Ostrogovski, "La Femme au Point de Vue du Droit Publique," is to appear in the same series at an early date.

— D C. Heath & Co., Boston, will soon issue the first four books of "Dichtung und Wahrheit," edited for them, with introduction and notes, by Professor C. A. Buchheim, editor of the Clarendon Press Series of German Classics. The edition will be especially adapted for pupils preparing for entrance to college, offering an advanced requirement in German, but will also have in view the numerous colleges that devote a portion of their time to the reading of Goethe's prose.

— The frequent reports that Russia is about to seize Bokhara will lend interest to the article by the Rev. Henry Lansdell, D.D., in the January *Scribner*, entitled "Bokhara Revisited." In this article he says: "It was not the policy of the Resident to interfere more than is necessary in the domestic affairs of the Khanate, except when they related to Russian subjects; and as for annexing the Khanate, 'why,' as one asked of me, 'should they do that?' To administer the country in Muscovite fashion would cost a great deal more than the taxes would pay for, and if the Russians want anything done, they have simply to nod to the Emir and he does it. They are much too wise, therefore, to annex Bokhara, but if need arises it can of course be done at any moment."

— *The Chautauquan* for January presents the following among other articles in its table of contents: Domestic and Social Life of the Colonists, IV., by Edward Everett Hale; Trading Companies, by John H. Finley; Physical Life, IV., by Milton J. Greenman; National Agencies for Scientific Research, IV., by Major J. W. Powell; Science and the Feeding of Animals, by V. Hallenbeck; Progress in the Nineteenth Century, by Edward A. Freeman; Some Propositions of Nationalism, by Edward Arden; Niagara the Motor for the World's Fair, by Professor John Trowbridge; The Kindergarten Movement in Chicago, by Antoinette Van Hoesen Wakeman; How Women Figure in the Eleventh Census, by Margaret N. Wishard; Women's Robes in the Orient, by Countess Annie de Montaigu.

— The American Academy of Political and Social Science has just published an essay on "Some Neglected Points in the Theory of Socialism." The author is T. B. Veblen of Ithaca. The monograph was written with the purpose of finding an economic ground for the existing unrest that finds expression in the demands of Socialists. The work is a criticism of Mr. Spencer's essay, "From Freedom to Bondage," and though Mr. Veblen claims to be rather a disciple than a critic of Mr. Spencer, he hardly proves himself such. The author shows very clearly how, under our present system, there is a constant effort even at the expense of real physical comforts and even necessities to make a greater display of one's ability to pay than one's neighbors. This "Economic Emulation" he regards as the chief underlying cause of the present socialistic agitation.

— The success of *The Atlantic Monthly* in certain departments during the last year or two will be continued during the year 1892, as shown by the following announcements. All the attractions which it will contain cannot, however, be mentioned here. The papers on marked men will include articles on George Bancroft, by W. M. Sloane; Orestes A. Brownson, by George Parsons Lathrop; John Esten Cooke, and Philip Pendleton Cooke, by Thomas Nelson Page; and James B. Eads, and others, will be continued. "An American at Home in Europe" is a series of papers by William Henry Bishop, the novelist, giving the experience of an American family which established itself abroad. Mr. Bishop tells about his experiences in daily living in Paris, Versailles, St.

Germain; the country and seacoast of France,— Dinan, Cherbourg, St. Malo, Pau; in Spain; in England,— Oxford, Windsor, Canterbury; in Italy,— Rome, Venice, Lucca, and Verona. Besides contributing fiction to the magazine, Mr. Henry James will furnish a paper of reminiscences of James Russell Lowell's London life. The "Studies of American Cities" are not mere descriptions, but criticisms, with a view to understanding the character of the cities which have the greatest influence on American life. The first of these will be a paper on Boston, by Ralph Waldo Emerson, now first published. "Private Life among the Romans" will be described in a paper by Miss Harriet Waters Preston and Miss Louise Dodge, whose joint studies of episodes of ancient history have won such high praise. Lafcadio Hearn will contribute some delightfully picturesque and graceful papers on Japanese life, as seen by a resident in Japan; and Mr. E. F. Fenollosa will discuss the influence of Japanese art on the art of Europe and America, in an early number. The best interests of the higher life of towns and cities will be considered in a series of papers on "Parks for Small Towns," "Local Museums of Art," "Free Libraries," etc. Papers on the Civil History of Our Country in War Time will be a feature of *The Atlantic* for 1892, and will be begun by an article by an eminent Southern scholar, giving the grounds for his unquestioning adherence to the Southern cause; and one by a distinguished man of science from a Border State, accounting for his own decision in the same emergency. Attention will be given this year to education generally, and especially to the education of girls and women. These papers — from the most eminent authorities — will follow in the same line as those by President Gilman, Professor Shaler, Dr. Cleveland Abbe, and others, which have appeared during the past year. The critical reviews of new books that are talked about will be continued.

— The December number of *The Engineering Magazine* contains a paper on "Landscape Beauty at Newport," by John De Wolf, which treats the subject from the standpoint of giving definite and practical ideas. In the same number is the first of Professor Coleman Seller's series, entitled "American Supremacy in Applied Mechanics," which should be read by every one who desires some knowledge of the men and the forces which have wrought such astonishing changes in this age of engineering and mechanical progress. Other papers in the same number are "A Permanent Census Bureau," by Edward Atkinson; "Geology from a Business Point of View," "Picturesque Suburban Railroad Stations," "Impure Water and Public Health," "Fulton Night with Mechanical Engineers," "Conditions Causing a Cold Wave," "The Canadian Pacific Railroad."

— A new edition of "A Girl in the Karpathians" is announced by the Cassell Publishing Company. It will contain a new portrait of the author, Miss Menie Muriel Dowie (now Mrs. Henry Norman), and a preface and introduction written by her especially

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Publications received at Editor's Office, Nov. 18-Dec. 15.

CARPENTER, WILLIAM B. The Microscope and its Revelations. Seventh Edit. revised by W. H. Dallinger. Philadelphia, Blakiston. 1,099 p. 8°.

DRUGGISTS' Reference Book, 1892. Philadelphia, Blakiston. 24°.

FINDLAY, GEORGE. The Working and Management of an English Railway. New York, Macmillan. 354 p. 12°. $1.50.

HARPER, WILLIAM R., and BURGESS, ISAAC B. An Inductive Latin Primer. New York, Amer. Book Co 424 p. 12°.

HOUGH, ROMEYN B. American Woods. Part I.: Wood Specimens in book-form, showing tranverse, radial and tangential sections. Lowville, N. Y., R. B. Hough. $5.00.

LOEWY, BENJAMIN. A Graduated Course of Natural Science Experimental and Theoretical for Schools and Colleges. Part II. New York, Macmillan. 257 p. 12°. 60 cents.

LOMBROSO, CESARE. The Man of Genius. New York, Scribner. 370 p. 12°. $1.25.

MASSEE, GEORGE. The Plant World. New York, Macmillan. 212 p. 12°. $1.

OCHOROWITZ, J. Mental Suggestion. Parts I.-IV. New York, Humboldt Publishing Co. 369 p. 8°. $1.20.

PETERS, EDWARD DYER. Modern American Methods of Copper Smelting. New York, Scientific Publishing Co. 398 p. 8°. $4.

PHYSICIAN'S Visiting List for 1892. Philadelphia, Blakiston. 24°.

SHALER, N. S. The Story of Our Continent. Boston, Ginn. 290 p. 12°.

SLOANE, T. O'CONOR. Electricity Simplified. New York, Henley. 154 p. 12°. $1.

TRIMBLE, HENRY. The Tannins. Vol. I. Philadelphia, Lippincott. 168 p. 12°. $2.

WAHNSCHAFFE, FELIX. A Guide to the Scientific Examination of Soils. Tr. by William T. Brant. Philadelphia, Baird. 177 p. 12°. $1.50.

WYATT, FRANCIS. The Phosphates of America. New York, Scientific Publishing Co. 187 p. 8°.

Wants.

Any person seeking a position for which he is qualified by his scientific attainments, or any person seeking some one to fill a position of this character, be it that of a teacher of science, chemist, draughtsman, or what not, may have the 'Want' inserted under this head FREE OF COST, *if he satisfies the publisher of the suitable character of his application. Any person seeking information on any scientific question, the address of any scientific man, or who can in any way use this column for a purpose consonant with the nature of the paper, is cordially invited to do so.*

WANTED.—*Science*, No. 178, July 2, 1886, also Index and Title-page to Vol. VII. Address N. D. C. Hodges, 874 Broadway, New York.

A YOUNG MAN (31) would like a position in a college, laboratory, or observatory, is also willing to assist at a steam engine, etc. Address J. W., care of *Science*, 874 Broadway, New York.

WANTED.—A position in the philosophical or pedagogical department of a college or university by a young man (30) who has had five years' practical experience in teaching, and who has done four years' post-graduate work in philosophy, devoting his attention during the last two years especially to study and original investigation in scientific psychology and its applications in education. Address E. A., care *Science*, 874 Broadway, N. Y. City.

WANTED.—A suitable position in Washington' D. C., not connected with the Government, and with a salary not to exceed $650 a year, by an experienced biologist with six years' university training. Applicant has been a skilful surgeon for fourteen years; is a practical photographer, cartographer, and accustomed to the use of the typewriter. He is also capable of making the most finished drawings, of any description, for all manner of illustrative purposes in science; trained in museum methods and work; also field operations and taxidermy in its various departments, and modeling, production of casts, restorations of paleontological specimens and similar employments. Address U. S. R, care *Science*, 47 Lafayette Place, N. Y.

WANTED.—By a young man (27), B.A. and Ph.D., with three years' experience as assistant in chemistry, position as instructor in chemistry or in natural sciences in college or academy, or other advantageous position as chemist. Give particulars as to work, salary, etc. F. W. MAR, L. Box 23, West Haven, Conn.

Exchanges.

[Free of charge to all, if of satisfactory character. Address N. D. C. Hodges, 874 Broadway, New York.]

Wanted to buy or exchange a copy of Holbrook's North American Herpetology, by John Edwards. 5 vols. Philadelphia, 1842. G. BAUR, Clark University, Worcester, Mass.

For sale or exchange, LeConte, "Geology;" Quain, "Anatomy," 2 vols.; Foster, "Physiology," Eng. edition; Shepard, Appleton, Elliott, and Stern, "Chemistry;" Jordan, "Manual of Vertebrates;" "International Scientists' Directory;" Vol. I. *Journal of Morphology;* Balfour, "Embryology," 2 vols.; Leidy, "Rhizopods;" *Science*, 18 vols., unbound. C. T. McCLINTOCK, Lexington, Ky.

For sale.—A 6½ x 8½ Camera; a very fine instrument, with lens, holders and tripod, all new; it cost over $40; price, $25. Edw. L. Hayes, 6 Athens street, Cambridge, Mass.

To exchange Wright's "Ice Age in North America" and Le Conte's "Elements of Geology" (Copyright 1882) for "Darwinism," by A. R. Wallace, "Origin of Species," by Darwin, "Descent of Man," by Darwin, "Man's Place in Nature," Huxley, "Mental Evolution in Animals," by Romanes, "Pre-Adamites," by Winchell. No books wanted except latest editions, and books in good condition. C. S. Brown, Jr., Vanderbilt University, Nashville, Tenn.

For Sale or Exchange for books a complete private chemical laboratory outfit. Includes large Becker balance (200g to 1-10mg.), platinum dishes and crucibles, agate motors, glass-blowing apparatus, etc. For sale in part or whole. Also complete file of *Silliman's Journal*, 1862-1885 (62-71 bound); Smithsonian Reports, 1854-1883; U. S. Coast Survey, 1854-1869. Full particulars to enquirers. F. GARDINER, JR., Pomfret, Conn.

For exchange or sale at a sacrifice, an elaborate microscope outfit. Bullock stand; monocular objectives, one-sixth homeogeneous immersion, four-tenths, and three inch, Bausch & Lomb, also one-fourth and one inch Spencer. Four eye-pieces. Objectives are the best made. Address Mrs. Marion Smith, 41 Branch Street, Lowell, Mass.

for this edition. The new portrait shows us a pretty woman, without the slightest suggestion of anything masculine about her. The same firm announces a new edition of the Hon. Chauncey M. Depew's 'Orations and After-Dinner Speeches;" also a life of "Henriette Ronner, the Painter of Cat Life and Cat Characters," by M. H. Spielmann, editor of the *Magazine of Art*. It is for her pictures of cat life and cat character that Mme. Ronner has gained her reputation. A book that is bound to attract attention is "Shall Girls Propose?" which the Cassell Publishing Company issue. It is written by a "Speculative Bachelor," and comes just in time for the new year, which is leap year.

— The forthcoming January number of *The Alienist and Neurologist* will contain: "Neurasthenic Rudimental Impulsive Paranoia," by Professor Enrico Morselli, Italy; "The Work of Medicine for the Weal of the World," by C. H. Hughes, M.D., St. Louis; "Some Cases of Hemiplegia," by John Ferguson, M D., Toronto, Canada; "Relations of Chorea and Epilepsy," by G. R. Trowbridge, M.D., Danville, Penn.; "The Virile and Other Reflexes," by C. H. Hughes, M.D., St. Louis; "Diagnosis and Nature of Certain Functional and Organic Nervous Diseases," by J. T Eskridge, M.D., Denver; "Traumatic Neurosis in Damage Suits," by H. T. Pershing, M.D., Denver; "Present Aspect of Cerebral Surgery," by L. C. Gray, M.D., New York City; "Visual Imagery of Alcoholic Delirium," by C. G. Chaddock, M.D., Traverse City, Mich·; "Insanity and Genius," by James G. Kiernan, M.D., Chicago; besides the usual selections, editorials, hospital notes, reviews, etc.

— Ginn & Co. announce *The Philosophical Review*, Vol. I., No. 1, to appear January, 1892, and to be edited by J. G. Schurman. The contents are: "Prefatory Note," "The Critical Philosophy and Idealism," by Professor John Watson; "Psychology as So-called 'Natural Science,'" by Professor George T. Ladd; "On Some Psychological Aspects of the Chinese Musical System," by Benjamin Ives Gilman; Reviews of Books; Summaries of Articles.